REMARKS

Claims 27-44 and 52-54 are presented for reconsideration. Claims 1-26 and 45-51 were canceled in previous Amendments. Claims 27, 37, and 43-44 are independent. Claims 28-36, 38-42, and 52-54 are dependent. Based on the following Remarks, the Applicant respectfully requests that the Examiner reconsider and withdraw all rejections and pass claims 27-44 and 52-54 to allowance.

Claims 27, 37, 43, and 44 have been amended. Support for amendments to claims 27, 37, 43, and 44 according to at least one embodiment of the present invention can be found on pages 22 and 24 of the Specification.

<u>Rejection of Claims 27-34, 37-38, 40, 42-44, and 52 Under 35 U.S.C. §§102(b) and (e)</u>

The Examiner rejected claims 27-34, 37-38, 40, 42-44, and 52 under 35 U.S.C. §§102(b) and (e) as being anticipated by the combination of Weiner et al. (IEEE J. Quantum Electronics) (hereinafter "Weiner"). Applicants respectfully traverse the rejection.

A claim is anticipated only if each and every element of the claim is found in a reference. (M.P.E.P. § 2131 *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987)). The identical invention must be shown in as complete detail as is contained in the claim. Id. *citing Richardson v. Suzuki Motor Co.*, 868 F.2d 1226,1236 (Fed. Cir. 1989)).

As a first matter, Weiner is directed to combining frequency-selective spatial structures and classic holographic techniques to realize many of the functionalities of frequency-selective materials. However, Weiner is at least limited to applications not involving spatial routing of optical beams.

As a second matter, in the present Office Action, the Examiner essentially makes several assertions, two of which include:

(1) that the spectral hologram recorded on the thermoplastic holographic plate in Weiner is identical to the subgratings supported by active material recited in the claimed invention; however, the Examiner points to no express or implicit teaching in Weiner or in the Applicants disclosure that these are identical; and

(2) that the "holographic fringe pattern" of Weiner is identical to the ordered assemblage of subgratings recited in the claimed invention. Applicants respectfully disagree; however, the Examiner points to no express or implicit teaching in Weiner or in the Applicants disclosure that these are identical.

Therefore, because the Examiner has failed to make a showing that the elements relied upon in Weiner are identical to the elements recited in the claimed invention, Applicants respectfully submit that the Examiner has failed to show that Weiner teaches each and every element of the claimed invention as required by MPEP §2131.

Rejection of Claims 27-31, 33, 35-38, 40-44, and 52 Under 35 U.S.C. §§102(e)

The Examiner rejected claims 27-31, 33, 35-38, 40-44, and 52 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,530,666 to Kashyap (hereinafter "Kashyap"). R. Kashyap et al. Electronics Letters (hereinafter "Kashyap Electronics Letters"). Applicants respectfully traverse the rejection.

A claim is anticipated only if each and every element of the claim is found in a reference. (M.P.E.P. § 2131 *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987)). The identical invention must be shown in as complete detail as is contained in the claim. Id. *citing Richardson v. Suzuki Motor Co.*, 868 F.2d 1226,1236 (Fed. Cir. 1989)). The elements must be arranged as required by the claim. Id. *citing In re Bond*, 910 F.2d 831 (Fed. Cir. 1990)).

In the present Office Action, the Examiner appears to be asserting that the gate 24 in Kashyap is identical to the router recited in claim 44. However, there is no disclosure in Kashyap that refers to the gate 24 as a router, Kashyap refers to the gate 24 as a gate that opens and closes. Therefore, because the Examiner has failed to make a showing that the elements relied upon in Weiner are identical to the elements recited in the claimed invention, Applicants respectfully submit that the Examiner has failed to show that Weiner teaches each and every element of the claimed invention as required by MPEP §2131.

<u>Rejection of Claims 34, 39, 53, and 54 Under 35 U.S.C. §103 (a)</u>

The Examiner rejected claims 27-31, 33, 35-38, 40-44, and 52 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,530,666 to Kashyap (hereinafter "Kashyap") in view of British Telecommunications (WO 93/14424) Applicants respectfully traverse the rejection. Applicants respectfully submit that claims 34, 39, 53, and 54 properly depend from patentable claims and are there patentable as well.

CONCLUSION

The Applicant submits that all grounds for rejection have been properly traversed. Therefore, the Applicant respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections and pass claims 27-44 and 52-54 to allowance. The Examiner is invited to telephone the undersigned representative if the Examiner believes that an interview might be useful for any reason.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date: 11/27/02 Jan Carol Little

Jan Carol Little
Reg. No. 41,181

Date of Deposit: November 27, 2002
I hereby certify that I am causing this paper or fee to be deposited with the United States Postal Service to Addressee" service on the date indicated above and that this paper or fee has been addressed to the Assistant Commissioner for Patents, Washington, D. C. 20231

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(Typed or printed name of person mailing paper or fee)

Dominique Valentino 11-27-02
(Signature of person mailing paper or fee) (Date signed)

VERSION OF SPECIFICATION WITH MARKINGS

An image can also be programmed into an active material to allow routing of an image encoded in a subsequent data beam. The simplest image is defined by two plane waves; generally, an image comprises multiple plane waves. The principles of the present invention as applied to plane-wave beams are directly applicable to combinations of plane wave beams. (Also, in the prior art, it is known that images can be stored and recalled from materials; [see, e.g.] see, e.g., U.S. Patent No. [5,256,637] 5,276,637.) Basically, such programming would involve the interaction of the material with an image-encoding set of direction beams (rather than a simple plane-wave direction beam).

VERSION OF CLAIMS WITH MARKINGS

27. (Twice Amended) A composite grating, comprising:

(a) an active material; and

(b) an ordered assemblage of subgratings supported by the active material for receiving input pulses along an input path and transmitting output pulses along an output path, wherein

(1) each subgrating satisfies a grating condition so as to diffract a respective subbandwidth of light from the input path to the output path, and

(2) the subgratings are configured such that (i) a first input optical pulse, incident to the active material along the input path and having a first address encoded or image encoded input waveform [a first prescribed input temporal waveform], produces an output optical pulse having a prescribed output temporal waveform and propagating along the output path, and (ii) a second input optical pulse, incident to the active material along the input path and having a second input address encoded waveform [a second prescribed temporal waveform], different from the first encoded address or image [first prescribed input temporal waveform], does not produce an output optical pulse having the [first] prescribed output temporal waveform, and propagating along the output path.

28. (Amended) The composite grating of claim 27, wherein the first input pulse and the output optical pulse at least partially spatially overlap.

29. The composite grating of claim 28 wherein the input pulses are received along the input path in an input direction and the output pulses are transmitted along the output path in a direction opposite to the input direction.

30. The composite grating of claim 27 wherein the prescribed output temporal waveform is a substantially temporally brief pulse.

31. (Amended) The composite grating of claim 27 wherein the prescribed output temporal waveform corresponds to a substantially minimum temporal duration optical waveform.

32. (Amended) The composite grating of claim 31 wherein the second prescribed temporal waveform is sufficiently orthogonal under cross correlation with the first prescribed temporal waveform as to produce substantially no substantially minimum temporal duration optical waveform from the composite grating when received thereby.

33. The composite grating of claim 31 wherein the second prescribed temporal waveform is sufficiently orthogonal under cross correlation with the first prescribed temporal waveform as to produce substantially no spike from the composite grating when received thereby.

34. The composite grating of claim 27 wherein the subgratings are supported on a surface of the active material, each respective subgrating satisfying the grating condition for the respective subbandwidth of light and the input path and the output path.

35. The composite grating of claim 27 wherein the subgratings comprise spatial variations in the refractive index of the active material.

36. The composite grating of claim 27 wherein the active material is a non-frequency-selective material.

37. (Amended) An optical waveform detector comprising:

(a) a detector capable of detecting light pulses having a prescribed detectable temporal waveform;

(b) a composite grating for receiving light pulses along an input path and transmitting light pulses to the detector along an output path, the composite grating comprising:

(1) an active material[:] ; and

(2) an ordered assemblage of subgratings supported by the active material wherein

(i) each respective subgrating satisfied at least one of [the] a Bragg condition [and the superficial] or a surficial grating condition so as to diffract a respective subbandwidth of light from the input path to the output path, and

(ii) the subgratings are so configured such that an input optical pulse interacting with the active material along the input path and having a prescribed address encoded input temporal waveform triggers an output optical pulse along the output path having the prescribed detectable temporal waveform, the prescribed detectable temporal waveform being different from the prescribed input temporal waveform.

38. The optical waveform detector of claim 37 wherein the subgratings are supported within a volume of the active material, each respective subgrating satisfying the Bragg condition for the respective subbandwidth of light and the input path and the output path.

39. (Amended) The optical waveform detector of claim 37 wherein the subgratings are supported on a surface of the active material, each respective subgrating satisfying the

[superficial] surficial grating condition for the respective subbandwidth of light and the input path and the output path.

40. The optical waveform detector of claim 37 wherein the input path and the output path are at least partially coextensive and wherein the input pulses travel to the composite grating in an input direction and the output pulses leave the composite grating in a direction opposite to the input direction.

41. The optical waveform detector of claim 37 wherein the subgratings comprise spatial variations in the refractive index of the active material.

42. The optical waveform detector of claim 37 wherein the active material is a non-frequency-selective material.

43. (Amended) A communications system comprising:

(a) a source of optical data[;] , the data comprising optical light pulses, each pulse having one of a set of specific address encoded temporal waveforms;

(b) a detector capable of detecting an optical pulse having a prescribed detectable temporal waveform different from each of the set of specific temporal waveforms; and

(c) a composite grating arranged to receive the light pulses from the source and to transmit, in response thereto, output light pulses along an output path to the detector, the grating comprising an ordered assemblage of subgratings supported by an active material, wherein

(1) each respective subgrating satisfies at least one of [the] a Bragg condition [and the superficial] or a surficial grating condition so as to diffract a respective subbandwidth of light from the source to the output path, and

(2) the subgratings are so configured such that

(i) an optical pulse received from the source, interacting with the active material and having a prescribed one of the set of specific temporal waveforms, triggers an output optical pulse along the

output path having the prescribed detectable temporal waveform, and

(ii) an optical pulse received from the source, interacting with the active material along the input path and having one of the set of specific temporal waveforms other than the prescribed one, does not trigger an output optical pulse along the output path having the prescribed detectable temporal waveform.

44. (Amended) An optical-waveform-sensitive routing system comprising:

(a) a router responsive to change the routing of data in response to an optical pulse having a prescribed detectable temporal waveform; <u>and</u>

(b) a composite grating for receiving input light pulses along an input path and transmitting, in response thereto, output light pulses to the router along an output path, the grating comprising an ordered assemblage of subgratings supported by an active material wherein

(1) each respective subgrating satisfies at least one of (i) [the] <u>a</u> Bragg condition [and] <u>or</u> (ii) [the superficial] <u>a surficial</u> grating condition so as to diffract a respective subbandwidth of light from the input path to the output path, and

(2) the subgratings are so configured such that an optical pulse received by the composite grating, interacting with the active material along the input path and having a prescribed <u>address encoded</u> input temporal waveform different from the prescribed detectable temporal waveform, triggers an output optical pulse along the output path having the prescribed detectable temporal waveform.

52. The composite grating of claim 27, wherein the grating condition is a Bragg condition.

53. The composite grating of claim 27, wherein the grating condition is a surficial grating condition.

54. The composite grating of claim 34, wherein the grating condition is a surficial grating condition.